REMARKS

Claims 1-29 are currently pending.

The Patent Office is thanked for its allowance of claims 6, 7, and 10 and its indication of allowable subject matter in claims 22-24 and 27-29. However, Applicant believes that all pending claims are in condition for allowance.

The Patent Office rejected claims 7 and 26-29 under 35 U.S.C. 101 as comprising non-statutory subject matter alleging that the preamble of the base claim relates to non-statutory subject matter. Applicant believes it is claim 25 that was intended to be rejected as claim 25 relates to a computer readable medium, claims 26-29 depend from claim 25 and not from claim 7, and claim 7 does not recite a computer readable medium. As claim 25 has been amended to recite "[a] computer-readable medium embodied with computer program instructions," it is believed that claims 25-29 fully comply with 35 U.S.C. 101 and it is respectfully requested that the Patent Office withdraw its rejection of these claims.

The Patent Office rejected claims 1-4, 8, 9, 11, 12, 14-18, 20, and 25 under 35 U.S.C. as being unpatentable over Pickering, "A Statistical Error Detection Technique for Low Bit-Rate Video," in view of Murphy, U.S. Patent No. 5,745,169.

Claim 1 recites as follows:

> A method for decoding compressed video data comprising: transforming information about the spatial frequency distribution of a video data block into pixel values; **generating, prior to said transformation, a first reference value** representing the variations in information about spatial frequency distribution within the block; **generating, after said transformation, a second reference value** representing the abruptness of variation in certain information between the block and at least one previously transformed video data block from a same frame as the block; comparing the first reference value to a certain first threshold value and the second reference value to a certain predetermined second threshold value; and detecting an error in the block, as a response to either of the first and second reference values being greater than the first and respectively the second threshold value.

Claim 15 recites as follows:

> A device for decoding compressed video data, comprising: means for transforming information about the spatial frequency distribution of a video data block into pixel values; means for **generating, prior to said**

transformation, a first reference value representing the variations in information about spatial frequency distribution within the block; means for **generating, after said transformation, a second reference value** representing the abruptness of variation in certain information between the block and at least one previously transformed video data block from a same frame as the block; means for comparing the first reference value to a certain first threshold value and the second reference value to a certain predetermined second threshold value; and means for detecting an error in the block, as a response to either of the first and second reference values being greater than the first and respectively the second threshold value.

Claim 20 recites as follows:

A device for decoding compressed video data, comprising: a memory configured to store at least video data blocks; and at least one processor coupled to the memory, the at least one processor configured to transform information about the spatial frequency distribution of a video data block into pixel values and configured to **generate, prior to said transformation, a first reference value** representing the variations in information about spatial frequency distribution within the block, the at least one processor also configured to **generate, after said transformation, a second reference value** representing the abruptness of variation in certain information between the block and at least one previously transformed video data block from a same frame as the block and to compare the first reference value to a certain first threshold value and the second reference value to a certain predetermined second threshold value, the at least one processor further configured to detect an error in the block, as a response to either of the first and second reference values being greater than the first and respectively the second threshold value.

Claim 25 recites as follows:

A computer-readable medium embodied with computer program instructions, execution of the computer program instructions resulting in operations comprising: transforming information about the spatial frequency distribution of a video data block into pixel values; **generating, prior to said transformation, a first reference value** representing the variations in information about spatial frequency distribution within the block; **generating, after said transformation, a second reference value** representing the abruptness of variation in certain information between the block and at least one previously transformed video data block from a same frame as the block; comparing the first reference value to a certain first threshold value and the second reference value to a certain predetermined second threshold value; and detecting an error in the block,

> as a response to either of the first and second reference values being greater than the first and respectively the second threshold value.

Pickering discusses two types of channel errors:

> Figure 1 shows a decoded frame of the Carphone sequence with distortion caused by channel errors. Two main types of distortion, which are typical of those observed in such sequences, can be seen in this image. They are:
>
> 1. 8x8 pixel blocks which have the wrong dc value, and
>
> 2. 8x8 pixel blocks which are dominated in appearance by a single DCT basis function.
>
> Errors of type 1 are caused by bit errors in the dc values and coded block pattern codeword of a macroblock. Errors of type 2 are caused by incorrect VLC codewords being decoded as a valid but incorrect run-level pair.

Pickering, page 774, §2. Detection of type 1 errors is discussed in section 3.1 of Pickering, and detection of type 2 errors is discussed in section 3.2 of Pickering.

It is noted that the techniques used in Pickering concern inter-frame (i.e., between frames) detection of errors, as opposed to intra-frame (i.e., within the same frame). It is noted that Pickering defines a "frame" implicitly when it states "Figure 1 shows a decoded ***frame*** of the Carphone sequence with distortion caused by channel errors". Pickering, page 774, §2 (emphasis added). For instance, section 3.1.1 of Pickering develops equations for MEPD (mean edge pixel difference), which appears to use information from blocks within a frame. However, the actual error detection is inter-frame:

> The value for the MEPD standard deviation is denoted by $\sigma_{1,n}$, where $n =$ 1...2 denotes the type of block, i.e. luminance or chrominance. These values are then used for the ***following frame*** to detect any MEPD values which are greater than some integer times the standard deviation for that block type.
> That is, for each MEPD value if MEPD > $\mu_{1,N}\sigma_{1,N}$ where $\mu_{1,N}$ is an integer value to be defined later, then an error is detected and a concealment algorithm will applied to the current slice.

Pickering, page 774, §3.1.2 (emphasis added). In other words, in Pickering values for $\sigma_{1,n}$ are determined for MEPDs for a current frame and a previous frame. An error is detected if the

value of the MEPD for the current frame differs by an integer value ($\mu_{1,N}$) multiplied by the MEPD for the previous frame. Therefore, an inter-frame determination of error is made in Pickering.

By contrast, claim 1 recites "generating, after said transformation, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block ***from a same frame as the block***" and "comparing the first reference value to a certain first threshold value and the second reference value to a certain ***predetermined*** second threshold value" (emphasis added). Applicant has therefore clarified that the second reference value uses intra-frame blocks. Thus, not only does the second reference value represent the abruptness of variation in certain information between the block and at least one previously transformed video data block ***from a same frame as the block***, but also the second reference value is compared to a certain ***predetermined*** second threshold value.

Furthermore, if $\mu_{1,N}\sigma_{1,N}$ in Pickering is considered to be a "second threshold value" as recited in claim 1 (with which Applicant does not admit), the value of $\mu_{1,N}\sigma_{1,N}$ depends on the value of the MEPD (i.e., $\sigma_{1,n}$) of a previous frame. The value of $\mu_{1,N}\sigma_{1,N}$ is therefore not predetermined, as its value depends on the value of the MEPD of a previous frame.

Because the technique in Pickering for comparing MEPD values concerns inter-frame error determination and the recited subject matter in claim 1 concerns intra-frame error determination, and because $\mu_{1,N}\sigma_{1,N}$ in Pickering is not predetermined, which the recited subject matter in claim 1 is a certain ***predetermined*** second threshold value, Pickering does not disclose (or imply) at least the subject matter of "generating, after said transformation, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block ***from a same frame as the block***" and "comparing the first reference value to a certain first threshold value and the second reference value to a certain ***predetermined*** second threshold value" (emphasis added).

Murphy does not disclose or imply the subject matter of "generating, after said transformation, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block ***from a same frame as the block***" and "comparing the first reference value to a certain first threshold value and the second reference value to a certain ***predetermined*** second threshold value" (emphasis added). This is true because Murphy is not directed to error detection using transformed video data and instead performs techniques prior to transformation.

Because neither Pickering nor Murphy disclose or imply this subject matter, the combination of these references does not disclose or imply this subject matter and claim 1 is patentable over the combination. Claim 15 recites similar subject matter, as claim 15 recites the subject matter of: "means for generating, after said transformation, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block ***from a same frame as the block***" and "means for comparing the first reference value to a certain first threshold value and the second reference value to a certain ***predetermined*** second threshold value". For at least the reasons given above, claim 15 is patentable over the combination of Pickering and Murphy.

It is also noted that one skilled in the art would not combine Pickering and Murphy in the manner described by the Examiner. For instance, in section 3.2, Pickering describes another inter-frame technique for correcting errors (in this case, type 2 errors). Meanwhile, Murphy describes intra-frame techniques. There is no disclosure or implication in Pickering that intra-frame techniques should be used for error correction. It is unclear as to why one skilled in the art would add intra-frame error determination from Murphy into the inter-frame error determination of Pickering, especially since Pickering only discloses that errors are determined and corrected on an inter-frame basis. Therefore, it is believed that one skilled in the art would not combine Pickering and Murphy in the way the Examiner postulates.

In reference to the Patent Office's "Response to Remarks" on page 2, the Patent Office asserted on page 3, lines 19-23, of the Final Office Action dated September 25, 2007, that Pickering discloses the following claimed subject matter:

> means for generating, after said transformation, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block **from a same frame as the block** (met by calculation of MAD between pixels inside and outside **the upper and left edges of each 8 x 8 block in a frame**) (page 774, **3.1**)

The mean absolute difference that the Patent Office appears to refer to (see first three lines of section 3.1) as the second reference value is not a reference value. Instead, the mean absolute difference between the pixels inside and outside the upper and left edges of each 8 x 8 block in a frame is used in calculating a reference value, the standard deviation for the mean edge pixel differences, on an interframe basis (see the fourth and following lines of section 3.1 as well as subsections 3.1.1 and 3.1.2).

The Patent Office asserted on page 4, lines 10-14, of the Final Office Action dated September 25 2007 as follows:

> However, Murphy et al teaches means for generating, prior to said transformation, a first reference value representing the variations in information about spatial frequency distribution within the block, means for comparing the first reference value to a certain first threshold vale; and means for detecting an error in the block, when the first reference value is greater than the first threshold value (Fig. 4).

In Murphy, the reference value T is read (column 5, lines 23-27) and is adjustable or selectable by an operator and the mean value P is calculated for previous frame variance values and a comparison of this previous mean value is made with the present variance value (column 5, lines 54-57). The calculation of the mean value P occurs after the variance V is calculated in Figure 4 and is not prior to a transformation. Neither Picker nor Murphy teach or suggest "generating, **prior to said transformation**, a first reference value representing the variations in information about spatial frequency distribution within the block" and "generating, **after said transformation**, a second reference value representing the abruptness of variation in certain information between the block and at least one previously transformed video data block from a same frame as the block" where the transformation is "transforming information about the spatial frequency distribution of a video data block into pixel values."

Thus, claims 1-29 are patentable over Pickering in view of Murphy.

The Patent Office rejected claims 5, 19, 25, and 26 under 35 U.S.C. 103(a) as being unpatentable over Pickering in view of Murphy, and further in view of Shimoda, U.S. Patent No. 5,703,889.

Claim 5 is patentable for at least the reasons given above with respect to claim 1. Furthermore, as for Shimoda, there does not appear to be any generation of reference values depending on DCT coefficients and comparison of the threshold reference values with certain threshold values. Consequently, it appears that even if there is disclosure in Shimoda of "dividing DCT coefficients of the block into at least two parts, wherein the coefficients of the first part are associated with higher frequencies than the coefficients of the second part", there is no reason for one skilled in the art to combine Shimoda with Pickering and Murphy, as there is absolutely no (at least that Applicant can find) disclosure or implication in Shimoda that the system in Shimoda would be used for generation of reference values and comparison of the reference values with certain threshold values.

Claim 5 recites "generating a first reference value from the coefficients of the first part; and generating a first threshold value from the coefficients of a set of coefficients not belonging to the first part."

Claim 19 recites "generating, prior to said transformation, a first reference value representing the variations in information about spatial frequency distribution within one of the groups of DCT coefficients of the video data block."

Claim 25 recites "generating, prior to said transformation, a first reference value representing the variations in information about spatial frequency distribution within the block."

Shimoda does not disclose or suggest generating a first reference value from the coefficients of the first part, as recited in claim 5, or generating a second reference value, as recited in claim 25. Thus, claims 5, 19, 25, and 26 (because it depends from claim 25) are not made obvious by a combination of Pickering, Murphy, and Shimoda for this additional reason.

Furthermore, Shimoda does not disclose or suggest generating a second reference value, as recited by claims 19 and 25. Thus, claims 19, 25, and 26 are not made obvious by a combination of Pickering, Murphy, and Shimoda for this additional reason.

The Patent Office rejected claim 13 under 35 U.S.C. 103(a) as being unpatentable over Pickering in view of Murphy as applied to claim 2 above, and further in view of Murata, U.S. Patent No. 5,535,013.

Claim 13 recites as follows:

> A method according to claim 2 comprising: generating the third reference value from the absolute sum of values of AC coefficients in a number of blocks in a macroblock; and generating the third threshold value from the estimated sum of values of AC coefficients needed to account for the variation in DC coefficients in said number of blocks.

Claim 13 is patentable for at least the reasons given above with respect to claim 1.

Furthermore, Murata describes Figure 4 as follows:

> FIG. 4 is a block diagram of the text area discrimination circuit 81 shown in FIG. 3. The low frequency AC coefficient adder circuit 91 calculates the sum of the absolute values of the five AC coefficients in the block shown in FIG. 5, and outputs this sum as signal 94. The comparator 92 compares the signal 94 with a predefined threshold value 93, and outputs a HIGH discrimination signal 83 if the signal 94 is greater than the predefined threshold value 93. In other words, the discrimination signal 83 is HIGH when the low frequency AC coefficients, which are the distinctive feature of the transformation coefficients when text images are contained in the block, are relatively high.

Murata does not disclose or suggest "generating the third threshold value from the estimated sum of values of AC coefficients needed to account for the variation in DC coefficients in said number of blocks."

Thus, claim 13 is allowable over the prior art for this additional reason.

It is respectfully submitted that the rejections of claims 1-29 under 35 U.S.C. 103(a) based on Pickering and Murphy, alone or in combination with Shimoda and/or Murata, have been

overcome, and respectfully requested that the Patent Office reconsider and remove the rejections of these claims. The Patent Office is respectfully requested to favorable consider and allow all of the pending claims 1-29 as now presented for examination. An early notification of the allowability of claims 1-29 is earnestly solicited.

Respectfully submitted:

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